

**AMENDMENTS TO THE CLAIMS:**

1. (Currently Amended) A method for ~~producing and evaluating~~ **a phenotype of a microbial** bioactive molecule **in the presence or absence of a compound** comprising the steps of:

- a) ~~providing a nucleic acid sequence comprising a bioactive molecule;~~
- b) ~~expressing the bioactive molecule encoded by the nucleic acid sequence obtained in step~~

(a);

**producing a microbial bioactive molecule by cell-free in vitro transcription and translation system of a nucleic acid comprising a sequence encoding the microbial bioactive molecule**, wherein the expressed **microbial** bioactive molecule has a detectable phenotype;

- e) contacting the **microbial** bioactive molecule **produced** ~~obtained in step (b)~~ with a compound; and
- d) detecting ~~the phenotype~~ **a functional activity** of the **microbial** bioactive molecule in the presence or absence of the compound ~~contacted in step (e)~~;

**wherein the functional activity of the microbial bioactive molecule in the presence of absence of the compound is indicative of a phenotype of the microbial bioactive molecule.**

2. (Currently Amended) The method of claim 1, wherein the **microbial** bioactive molecule is selected ~~from the group consisting of:~~ a viral molecule, a bacterial molecule, a fungal molecule, **or** a protozoal molecule, ~~a human molecule and an animal molecule.~~

3. (Withdrawn) The method of claim 1, wherein the **microbial** bioactive molecule is ~~a protein~~ further comprising a retrovirus protein, a herpesvirus protein, a hantavirus protein, a hepatitis virus protein, an influenza protein, a myxovirus protein, a picomavirus protein, an adenovirus protein, a poxvirus protein, a flavivirus protein or a coronavirus protein.

4. (Withdrawn) The method of claim 1, wherein the **microbial** bioactive molecule is ~~a protein~~ further comprising a streptococcus protein, a staphylococcus protein, an enterococcus protein, a neisseria protein, a salmonella protein, a ~~mycobacteria~~ **mycobacteria** protein, a bacillus protein, a mycoplasma protein, a chlamydia protein, a francisella protein, a pasteurilla protein, a brucella protein, a

pseudomonas protein, a listeria protein, a clostridium protein, a yersinia protein, a vibrio protein, a shigella protein, or an enterobacteriaceae protein.

5. **(Withdrawn)** The method of claim 1, wherein the microbial bioactive molecule is ~~a protein further comprising~~ a plasmodium protein, a trypanosome protein, or a cryptosporidium protein.

6. **(Withdrawn)** The method of claim 1, wherein the microbial bioactive molecule is ~~a protein further comprising~~ a candida protein, a cryptococcus protein, a malassezia protein, a histoplasma protein, a coccidioides protein, a hyphomyces protein, a blastomyces protein, an aspergillus protein, a penicillium protein, a pseudallescheria protein, a fusarium protein, a paecilomyces protein, a mucor/rhizopus protein, a pneumocystis protein, a rhinosporidium protein, a sporothrix protein, a trichophyton protein, a microsporum protein, an epidermophyton protein, a basidiobolus protein, a conidiobolus protein, a rhizopus protein, a Cunninghamella protein, a paracoccidioides protein, a pseudallescheria protein, or a rhinosporidium protein.

7. **(Currently Amended)** The method of claim 1, wherein the nucleic acid sequence encoding the biomolecule microbial bioactive molecule is deoxyribonucleic acid or ribonucleic acid.

8. **(Currently Amended)** The method of claim 1 or claim 7, wherein the nucleic acid sequence encoding ~~the~~ a bioactive molecule ~~further comprises transfer RNA~~ an messenger RNA or polyA+ RNA.

9. **(Currently Amended)** The method of claim 1, wherein the microbial bioactive molecule is ~~further comprises a protein, a protein or~~ a glycoprotein, ~~a polysaccharide, a mucopolysaccharide, a lipopolysaccharide, a lipoprotein, a carbohydrate, or a nucleic acid.~~

10. **(Currently Amended)** The method of claim 1, wherein the cell-free in vitro transcription and translation system is ~~bioactive molecule encoded by the nucleic acid is expressed in a cell-free~~ a eukaryotic cell lysate ~~translation~~ system.

11. (Currently Amended) The method of claim 1, wherein the cell-free in vitro transcription and translation system is ~~bioactive molecule encoded by the nucleic acid is expressed in a cell-free~~ a prokaryotic cell lysate translation system.

12. (Currently Amended) The method of claim 10, wherein the cell-free in vitro transcription and translation system is ~~bioactive molecule encoded by the amplified nucleic acid sequence is expressed in a cell-free~~ a reticulocyte lysate translation system.

13. (Currently Amended) The method of claim 12, wherein the cell-free in vitro transcription and translation system is ~~bioactive molecule encoded by the amplified nucleic acid sequence is expressed in a cell-free~~ a rabbit reticulocyte lysate coupled transcription/translation system.

14. (Currently Amended) The method of claim 13, wherein ~~the bioactive molecule encoded by the nucleic acid sequence and expressed in a cell-free reticulocyte lysate coupled transcription/translation system is a nucleic acid selected from the group consisting of:~~ the microbial bioactive molecule is produced from a deoxyribonucleic acid, a ribonucleic acid, a polyA+ RNA, a messenger RNA tRNA, and an rRNA.

15. (Currently Amended) The method of claim 1, wherein the nucleic acid sequence comprising a sequence encoding ~~that encodes the~~ microbial bioactive molecule is operably linked to further comprises a second nucleic acid sequence ~~operably linked to said bioactive molecule.~~

16. (Currently Amended) The method of claim 15, wherein the second nucleic acid comprises ~~a sequence comprises~~ encoding a regulatory element.

17. (Currently Amended) The method of claim 15, wherein the second nucleic acid sequence comprises a sequence encoding a purification motif.

18. (Currently Amended) The method of claim 15, wherein the second nucleic acid comprises ~~a sequence encodes~~ encoding a gene product or fragment thereof comprising a purification motif.

19. **(Currently Amended)** The method of claim 1, wherein the compound is bioactive molecule ~~is contacted with a compound selected from the group consisting of:~~ an anti-viral compound, an anti-bacterial compound, an anti-fungal compound, ~~an anti-cancer compound, an immunosuppressive compound, a hormone,~~ a cytokine, a lymphokine, a chemokine, an enzyme, a polypeptide, a polynucleotide, and or a nucleoside analogue.

20. **(Currently Amended)** The method of claim 1, wherein detecting the ~~phenotype~~ the functional activity of the microbial bioactive molecule ~~further comprises assaying the~~ an enzymatic activity of the microbial bioactive molecule.

21. **(Currently Amended)** The method of claim 20 1, wherein said detecting is performed in across a concentration range of compound to assess a sensitivity or resistance phenotype of the microbial bioactive molecule ~~assaying the enzymatic activity of the bioactive molecule further comprises assaying the bio active molecule for a resistance phenotype to the compound.~~

22. - 25. **(Canceled)**

26. **(Currently Amended)** The method of claim 1, wherein prior to said producing, the method further comprises ~~the method is preceeded by the step of:~~  
amplifying a nucleic acid ~~sequence in a cell free system,~~ wherein the nucleic acid comprises a sequence encoding ~~comprises a~~ microbial bioactive molecule.

27. **(Currently Amended)** The method of claim ~~1~~ 26, wherein said amplifying is by the nucleic acid encoding a bioactive molecule is amplified by a reaction selected from the group consisting of: a polymerase chain reaction, a ligase chain reaction, a transcription mediated amplification reaction, a nucleic acid sequence based amplification reaction, and or a strand displacement amplification reaction.

28. **(Currently Amended)** The method of claim 1, wherein prior to said producing, the method further comprises amplifying ~~the~~ a nucleic acid encoding the microbial bioactive molecule ~~biomolecule comprises a polymerase chain reaction further comprising~~ using one or more nested primer sets.

29. **(Withdrawn)** The method of claim 1 ~~or claim 26~~, wherein said amplifying ~~the nucleic acid encoding the biomolecule~~ uses a primer having a nucleic acid sequence of SEQ ID NO:2, SEQ ID NO:3, or SEQ ID NO:4.

30. **(Currently Amended)** The method of claim 1 ~~or claim 26~~, wherein the nucleic acid comprising a sequence encoding the microbial bioactive molecule is obtained by the method ~~is preceded by the step of: extracting one or more specimen specimens from a patient afflicted with a disease state, wherein the specimens comprise a bioactive molecule associated with the disease state.~~

31. - 34. **(Canceled)**

35. **(New)** A method for evaluating a phenotype of a microbial bioactive molecule in the presence or absence of a compound comprising the steps of:

amplifying from a sample a nucleic acid comprising a sequence encoding a microbial bioactive molecule, wherein the microbial bioactive molecule has a detectable phenotype, said amplifying using one or more nested primer sets to produce an amplified nucleic acid product;

producing the microbial bioactive molecule by cell-free in vitro transcription and translation system of the amplified nucleic acid product;

contacting the microbial bioactive molecule produced with a compound; and

detecting a functional activity of the microbial bioactive molecule in the presence or absence of a compound;

wherein the functional activity of the microbial bioactive molecule in the presence or absence of the compound is indicative of a phenotype of the microbial bioactive molecule.

36. **(New)** The method of claim 35, wherein said producing proceeds without purification of the amplified nucleic acid product.

37. **(New)** The method of claim 35, wherein the functional activity is an enzymatic activity.

38. **(New)** The method of claim 35, wherein the microbial bioactive molecule is a viral molecule.

39. **(New)** The method of claim 39, wherein the viral molecule is a protein or an mRNA.

40. **(New)** The method of claim 35, wherein the microbial bioactive molecule is a bacterial molecule, a fungal molecule, or a protozoal molecule.

41. **(New)** The method of claim 40, wherein the microbial bioactive molecule is a protein or a RNA.

42. **(New)** The method of claim 35, wherein the cell-free in vitro transcription and translation system is a eukaryotic cell lysate system.

43. **(New)** The method of claim 35, wherein the sample is from a patient infected with a microbe.